

# इंटरनेट

# मानक

## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8477 (1985): Methods for determination of bitumen content in laminated jute bags [TXD 5: Chemical Methods of Test]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



"पुनर्पठित १९९६"

"RE-AFFIRMED 1996"

IS : 8477 - 1985

Indian Standard "पुनर्पठित १९९६"

"REAFFIRMED 1996"

METHODS FOR  
DETERMINATION OF BITUMEN CONTENT IN  
LAMINATED JUTE BAGS

( *First Revision* )

UDC 621.798.151 - 419 : 677.13.027.651.32 : 543.869



© Copyright 1986

INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

## METHODS FOR DETERMINATION OF BITUMEN CONTENT IN LAMINATED JUTE BAGS

( First Revision )

### Chemical Methods of Test Sectional Committee, TDC 5

#### Chairman

DR ( KUMARI ) M. D. BHAVSAR

#### Representing

Silk and Art Silk Mills' Research Association,  
Bombay

#### Members

SHRI JAMSHED D. ADRIANVALA

The Tata Mills Limited, Bombay

DR V. G. AGNIHOTRI

National Peroxide Limited, Bombay

SHRI A. K. BANDOPADHYAY

Ministry of Defence ( DGI )

KUMARI L. C. PATEL ( Alternate )

SHRI P. K. BASU

Directorate General of Supplies and Disposals  
( Inspection Wing ), New Delhi

SHRI A. K. SAIGAL ( Alternate )

SHRI M. L. BEHRANI

Ministry of Defence ( R & D )

SHRI N. KASTURIA ( Alternate )

SHRI C. BHATTACHARYA

Indian Petrochemicals Corporation Limited,  
Vadodara

SHRI D. K. CHATTOPADHYAY ( Alternate )

DR D. K. DAS

National Test House, Calcutta

SHRI N. C. CHATTERJEE ( Alternate )

SHRI K. S. DESIKAN

Office of the Textile Commissioner, Bombay

SHRI PAUL LINGDOH ( Alternate )

DIRECTOR, WEAVERS' SERVICE  
CENTRE, BOMBAY

Development Commissioner for Handlooms,  
New Delhi

SHRI M. D. DIXIT

The Bombay Textile Research Association,  
Bombay

SHRI D. K. SINHA ( Alternate )

DR V. G. KHANDEPARKAR

Cotton Technological Research Laboratory  
( ICAR ), Bombay

DR B. R. MANJUNATHA

Intexa India, Bombay

SHRI SUNIL S. MEHTA

Silk and Art Silk Mills' Association, Bombay

( Continued on page 2 )

© Copyright 1986

INDIAN STANDARDS INSTITUTION

The publication is protected under the *Indian Copyright Act* ( XIV of 1957 ) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

( Continued from page 1 )

<i>Members</i>	<i>Representing</i>
DR A. K. MUKHERJEE	Indian Jute Industries' Research Association, Bombay
DR ( SHRIMATI ) U. NANDURKAR	Wool Research Association, Bombay
DR S. N. PANDEY	Cotton Technological Research Laboratory ( ICAR ), Bombay
KUMARI I. G. BHATT ( <i>Alternate</i> )	
DR ( SHRIMATI ) G. R. PHALGUMANI	Textiles Committee, Bombay
SHRI P. R. V. RAMANAN	Central Excise and Customs ( Ministry of Finance ), New Delhi
SHRI P. K. KHERE ( <i>Alternate</i> )	
SHRI M. S. RATHODE	National Textile Corporation, New Delhi
SHRI P. P. CHECKER ( <i>Alternate</i> )	
REPRESENTATIVE	Crescent Dyes and Chemicals Ltd, Calcutta
SHRI S. R. ANANTHAKRISHNA SETTY	Binny Limited, Madras
DR M. G. MODAK ( <i>Alternate</i> )	
SHRI J. J. SHAH	The Bombay Millowners' Association, Bombay
SHRI JAMNADAS K. SHAH	The Arvind Mills Limited, Ahmadabad
SHRI K. G. SHAH	Ahmedabad Manufacturing and Calico Printing Co Ltd, Ahmadabad
DR J. I. SETALWAD ( <i>Alternate</i> )	
SHRI S. S. TRIVEDI	Ahmedabad Textile Industrys' Research Association, Ahmadabad
SHRI J. N. VOHRA	Punjab State Hosiery and Knitwear Development Corporation Ltd, Chandigarh
SHRI P. T. BANERJEE ( <i>Alternate</i> )	
SHRI R. I. MIDHA, Director ( Tex )	Director General, ISI ( <i>Ex-officio Member</i> )
<i>Secretary</i>	
SHRI M. S. VERMA Assistant Director ( TEX ), ISI	

## Chemical Test Methods Subcommittee, TDC 5 : 14

<i>Convener</i>	
SHRI S. S. TRIVEDI	Ahmedabad Textile Industries' Research Association, Ahmadabad
<i>Members</i>	
SHRI D. K. JAIN ( <i>Alternate to</i> Shri S. S. Trivedi )	
DR V. G. AGNIHOTRI	National Peroxide Limited, Bombay
SHRI A. K. BANDOPADHYA	Ministry of Defence ( DGI )
KUMARI L. C. PATEL ( <i>Alternate</i> )	
SHRI K. S. DESIKAN	Office of the Textile Commissioner, Bombay
SHRI PAUL LINGDOH ( <i>Alternate</i> )	
DR B. L. GHOSH	Indian Jute Industries Research Association, Calcutta
DR K. P. DAS ( <i>Alternate</i> )	
DR ( SHRIMATI ) U. NANDURKAR	Wool Research Association, Bombay
SHRIMATI G. P. RANE ( <i>Alternate</i> )	

( Continued on page 8 )

# *Indian Standard*

## METHODS FOR DETERMINATION OF BITUMEN CONTENT IN LAMINATED JUTE BAGS

### *(First Revision)*

#### 0. FOREWORD

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 15 November 1985, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

**0.2** Jute bags laminated with craft paper or polyethylene film using bitumen as the bonding material are extensively used these days for packing materials like pesticides, fertilizers, etc. This method was evolved for determining the amount of bitumen used for bonding the liner and the jute fabric as its quantity is important for the performance of the laminated jute bag. The standard has been revised to include a more simplified method based on conditioning of the test specimens in a desiccator containing saturated solution of sodium nitrite.

**0.3** Method 1 based on conditioning of the test specimens in a standard atmosphere or in a conditioning chamber is time consuming and requires the use of conditioning chamber. Method 2 based on conditioning of the test specimens in a desiccator containing saturated solution of sodium nitrite is easier and cheaper and does not require a special instrument for conditioning of the test specimens.

**0.4** In reporting the result of a test made in accordance with this standard, if the final value, observed or calculated is to be rounded off, it shall be done in accordance with IS : 2-1960\*.

---

#### 1. SCOPE

**1.1** This standard prescribes two methods for determination of bitumen content in laminated jute bags.

---

\*Rules for rounding off numerical values (*revised*).

## 2. PRINCIPLE

**2.1** A specimen of laminated fabric of known mass is taken and the liner is removed by dipping in a suitable solvent and then the fabric portion is extracted in Soxhlet apparatus. From the mass of the initial piece, liner and extracted fabric, the bitumen content is calculated.

## 3. SAMPLING

**3.1** Lot — The quantity of laminated jute bags purporting to be of one definite type and quality delivered to a buyer against one despatch note shall constitute a *lot*.

**3.2** The sample shall be so drawn as to be the representative of the lot. The sample drawn in accordance with the procedure laid down in the material specification or as agreed to between the buyer and the seller shall be taken as representative of the lot.

## 4. PREPARATION OF TEST SPECIMEN

**4.1** From the sample, cut four pieces of 100 mm × 100 mm taking one piece from the area near the mouth, the other from the area close to the bottom and two pieces from the middle portions of the bag. The pieces shall be taken in such a way that they contain spot application portion in case the bitumen is applied off-set.

## 5. METHOD 1

### 5.1 Conditioning of Test Specimens

**5.1.1** Before testing, condition the specimens to moisture equilibrium in standard atmosphere at  $27 \pm 2^\circ\text{C}$  temperature and  $65 \pm 2$  percent relative humidity ( *see also* IS : 6359-1971\* ).

**5.1.1.1** When the test specimens have been left in such an atmosphere for at least 24 hours in such a way as to expose, as far as possible, all portions of the specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium.

**5.1.2** In case arrangements are not there for conditioning the test specimens in standard atmosphere, these may be conditioned in a conditioning chamber and mass determined immediately after the removal of the test specimens from the conditioning chamber.

---

\*Method for conditioning of textiles.



## 5.2 Apparatus and Reagents

### 5.2.1 Soxhlet Apparatus

5.2.2 *Weighing Balance* — with an accuracy up to 1 mg.

5.2.3 *Solvent* — Light petroleum or any other suitable solvent such as trichloroethylene or perchloroethylene.

## 5.3 Procedure

5.3.1 Take the conditioned test specimens and determine their collective mass to the nearest milligram.

5.3.2 Wash all the specimens with the solvent ( *see* 5.2.3 ) and carefully separate the liner pieces. Wash the liner pieces with solvent to remove adhering traces of oil and bitumen.

5.3.3 Dry the liner pieces in air and determine their collective mass to the nearest milligram ( *see* Note ).

NOTE — If the liner pieces are made of craft paper, these shall be conditioned before determining their collective mass.

5.3.4 Take the four fabric pieces obtained after the removal of liner pieces from the test specimens and place them in a thimble of the Soxhlet apparatus. Take about 400 ml of the solvent in the extraction flask. Extract the pieces for  $1\frac{1}{2}$  to 2 hours at a rate of about 6 cycles per hour. Take out the fabric pieces and let the solvent evaporate.

5.3.5 Condition the fabric pieces as given in 5.1.1 or 5.1.2 as the case may be, and determine their collective mass to the nearest milligram.

5.3.6 Calculate the quantity of bitumen per square metre as given in 7.1 and 7.1.1.

## 6. METHOD 2

### 6.1 Apparatus and Reagents

#### 6.1.1 Soxhlet Apparatus

6.1.2 *Weighing Balance* — With an accuracy up to 1 mg.

6.1.3 *Desiccator* — Suitable size, charged with saturated solution of sodium nitrite at  $27 \pm 2^\circ\text{C}$ .

6.1.4 *Solvent* — Light petroleum or any other suitable solvent such as trichloroethylene or perchloroethylene.

## 6.2 Procedure

**6.2.1** Condition all the test specimens ( *see 4.1* ) in the desiccator charged with saturated solution of sodium nitrite at  $27 \pm 2^{\circ}\text{C}$  for at least 24 hours in such a way that the fabric side of each specimen is exposed to the air inside the desiccator.

**6.2.2** Remove all the specimens from the desiccator and immediately determine their collective mass to the nearest milligram.

**6.2.3** Wash all the specimens with the solvent ( *see 6.1.4* ) and carefully separate the liner pieces. Wash the liner pieces with solvent to remove adhering traces of oil and bitumen.

**6.2.4** Dry the liner pieces in air and determine their collective mass to the nearest milligram ( *see Note under 5.3.3* ).

**6.2.5** Take the four fabric pieces obtained after the removal of the liner pieces from the test specimens and place them in the thimble of the Soxhlet apparatus. Take about 400 ml of the solvent in the extraction flask. Extract the fabric pieces for  $1\frac{1}{2}$  to 2 hours at a rate of about 6 cycles per hour. Take out the fabric pieces and let the solvent evaporate.

**6.2.6** Place the fabric pieces in the desiccator charged with saturated solution of sodium nitrite at  $27 \pm 2^{\circ}\text{C}$  for at least 24 hours exposing both sides of each fabric piece as far as possible to the air inside the desiccator.

**6.2.7** Remove the fabric pieces from the desiccator and immediately determine their collective mass to the nearest milligram.

**6.2.8** Calculate the quantity of bitumen per square metre as given in 7.1 and 7.1.1.

## 7. CALCULATION

**7.1** Calculate the quantity of bitumen per square metre by the following formula :

$$X = 25 [ a - ( b + c + d ) ] \text{ g/m}^2$$

where

$X$  = mass of bitumen per square metre of the laminated fabrics;

$a$  = combined mass of the conditioned test specimens;

$b$  = combined mass of the liner pieces;

$c$  = combined conditioned mass of the extracted fabric pieces; and

$d$  = correction factor for oil content of the fabric.

**7.1.1** Calculate the value of  $d$  by the following formula:

$$d = \frac{c \times y}{100}$$

where

$c$  = combined conditioned mass of the extracted fabric pieces; and

$y$  = oil content percentage of the fabric as specified in the material specification, on conditioned mass basis ( *see* Note ).

**NOTE** — Generally five percent oil content on conditioned mass basis is used for hessian and double-warp thread fabrics made of jute. For other fabrics use the value as given in the material specification based on conditioned mass. Five percent of oil content on conditioned mass corresponds to six percent of oil content on dry de-oiled material basis.

## 8. REPORT

**8.1** The report shall include the following information:

- a) Type of material;
- b) Bitumen content per square metre; and
- c) Method of bitumen application, namely, continuous or off-set bonding.

( Continued from page 2 )

<i>Members</i>	<i>Representing</i>
DR ( SHRIMATI ) G. R. PHALGUMANI	Textiles Committee, Bombay
SHRI J. J. SHAH	The Bombay Millowners' Association, Bombay
SHRI JAMNADAS K. SHAH	Raipur Manufacturing Co Ltd, Ahmadabad
SHRI ISHWARBHAI M. PATEL ( <i>Alternate</i> )	
SHRI KANUBHAI M. SHAH	SLM-Maneklal Industries Ltd, Bombay
DR G. S. SINGH	Raymond Woollen Mills Ltd, Thane
SHRI J. K. BANERJEE ( <i>Alternate</i> )	
SHRI K. S. TARAPOREWALA	Silk & Art Silk Mills' Research Association, Bombay
SHRI S. VARADARAJAN	The Bombay Textile Research Association, Bombay